

**REMARKS**

Applicant has inserted the headings suggested by the Examiner.

Applicant respectfully requests the Examiner to reconsider and withdraw the rejections of claims 1-19 under 35 U.S.C. § 112, second paragraph. With respect to paragraph 3(i), if it were not clear before, Applicant has amended claim 1 to make it clear that this claim is drawn to a "system", not a method.

With respect to paragraph 3(ii), Applicant has amended claim 1 in the manner suggested by the Examiner.

With respect to paragraph 3(iii), Applicant has amended claim 1 to replace "a physical parameter" with --mass--, and deleted "mass" from dependent claim 2. The "physical parameter" clearly encompasses the "fluorescent signal" (e.g., see claim 2, and specification page 3, lines 12-20). With respect to the Examiner's request for clarification of the term "elementary strand", Applicant submits that this term's meaning in the context of the complete phrase, "from the end of an elementary strand of the biological entity", is quite clear. The recited "biological entity" is a chemical entity having a high molecular weight, such as oligonucleotides peptides and polysaccharides (see specification page 2, lines 11-12 from the bottom), having side chains named "elementary strand" with special nucleotide sequences, one end 5' of which acts for the hybridization to the detection unit 4, the other free end 3' allowing a mass increase by polymerisation (specification page 3, 13 from the bottom). Thus, the meaning of "elementary strand" is well known to persons of ordinary skill in the involved art.

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. APPLN. NO. 10/031,168

With respect to paragraph 3(iv), Applicant has replaced the mistranslated word "classes", with --kinds--, and amended the claim to make it clear that the kind/kinds refer to enzyme/enzymes.

With respect to paragraph 3(v), the word "means" was not intended to be a part of a "means-plus-function" limitation, but Applicant has replaced the word "means" with "device" to avoid any confusion.

With regard to paragraph 3(vi), Applicant has canceled the "such as" clause from claim 15, and reintroduced the involved limitation in the new dependent claim 20.

Applicant respectfully traverses the rejections of claims 1-9 as being anticipated under 35 U.S.C. § 102(b) by one or more of the following three references: Pinkel '894; Chai-Gao '802; and Lockhart (WO '317).

First, to understand the irrelevancy of these three references to the claimed invention, it is absolutely necessary to emphasize which features disclosed in these references are not part of the claimed "biochemical sensor system", namely :

the detection of a plurality of species by means of a plurality of "detection molecules" (or "binding partners") which are immobilized on a solid support or chip;

the way through which said binding partners are immobilized at the surface sensor;

methods of end-labeling a nucleic acid;

the method for showing, with a single sensor, differences of expression levels between at least two samples containing nucleic acids; and

methods of detection of a specific physical measurable parameter at the surface sensor.

All these features were well known to the Applicant at the time of filing, with the drawbacks mentioned in the specification at page 2, lines 17-20, namely that none of these prior art teachings allows a sufficiently high signal to be obtained to make them able to be used efficiently in practice, especially for the detection of biomolecules present in the biotic medium in traces.

A key point of the claimed invention is to provide a biochemical sensor system allowing the detection of such biomolecules in traces, thanks to a molecular amplification of the signal. This amplification is obtained because of monomer compounds and catalytic units which are present in the biotic medium and which induce a chain extension leading to an increase in mass at the surface sensor.

Paragraph 4 A - Rejection based on Pinkel et al (US 5 690 894)

**Pinkel** discloses a biosensor whose surface is made of the ends of a multiplicity of optical fibers bundled together, each fiber or group of fibers bearing a particular species of binding partner, so that a single sensor allows the detection of a plurality of analytes in a test sample. Pinkel is merely illustrative of the prior art already cited at page 2 of the specification, and does **not anticipate** what is specifically claimed in claim 1, namely a signal amplification by an increase in mass.

Paragraph 4B. Rejection based on Chai-Gao et al (US 5 859 802)

**Chai-Gao**, which was well known to the Applicant as originating from the same team research, is focused on the functionalization of covalently bonded nitrides, but does **not at all** disclose the subject matter of claim 1, namely the amplification of the signal as a result of the chain extension.

Paragraph 4C - Rejection based on Lockhart (WO '317)

**Lockhart** is voluminous, and discusses two major topics, namely:

- i) a method for identifying differences in expression levels between at least two samples;
- and
- ii) a method for end-labeling a nucleic acid.

With respect to the Lockhart passages specifically identified by the Examiner, Applicant must respectfully disagree with the Examiner's analysis regarding claim 1:

page 127, lines 25-32, of Lockhart disclose a biosensor array designed for generic difference screening of a plurality of biological entities in a single biological sample, the biosensor being possibly a part of a kit (page 90, lines 5-21); **nothing** is said or suggested about a possible signal amplification;

page 128, lines 29-31, and page 129, lines 1-24, show how it is possible to increase the signal representative of the differences between oligonucleotides pairs, but is **not at all** based on a chain extension; and

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. APPLN. NO. 10/031,168

page 131, lines 10-31, and page 132, lines 1-2, show an example of PCR labeling of nucleic acid but do **not** include any teaching about a signal amplification by way of a chain extension.

A rejection under 35 U.S.C. § 102(b) based on anticipation requires that the applied reference teach, either expressly or inherently, each limitation of the rejected claim, or in other words that the rejected claim be readable on the reference. As shown by the above analyses of Pinkel, Chai-Gao and Lockhart, clearly such is **not** the case here, as the rejected claims 1-19 clearly are **not readable**, either expressly or inherently, on any of these references.

Therefore, Applicant respectfully requests the Examiner to reconsider and withdraw all objections and rejections, especially the three rejections under 35 U.S.C. § 102(b), and to find the application to be in condition for allowance with all of claims 1-19 and 20 (which is dependent on the allowable claim 15). However, if for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is respectfully requested to **call the undersigned attorney** to discuss any unresolved issues and to expedite the disposition of the application.

Applicant files concurrently herewith a Petition (with fee) for an Extension of Time of three months. Applicant hereby petitions for any extension of time which may be required to maintain the pendency of this application, and any required fee for such extension is to be charged to Deposit Account No. 19-4880. The Commissioner is also authorized to charge any

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. APPLN. NO. 10/031,168

additional fees under 37 C.F.R. § 1.16 and/or § 1.17 necessary to keep this application pending in  
the Patent and Trademark Office or credit any overpayment to said Deposit Account No. 19-4880.

Respectfully submitted,

  
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